

NEW CYCLOGASTERID FISHES FROM JAPAN.

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The expedition in 1906 of the Fisheries steamer *Albatross* to the northwest Pacific made notable additions to the cyclogasterid fauna of Bering Sea and Japan. A total of 35 new species were secured, of which 23 were from Japanese waters, and are here described. The family is unquestionably of boreal origin, and is distributed along shore and in moderate depths as far toward the Tropics as the colder currents can be distinctly traced. Farther south, a limited number of species occur at greater depths. The group is richly represented in the Okhotsk Sea, extends its range throughout the Sea of Japan to the Straits of Tsushima, and on the eastern side of Hondo regularly at least as far to the south as Matsushima Bay. Beyond this point northern species are not known to extend, but two peculiar gigantic forms (*Cyclogaster owstoni* and *Cyclogaster tanakæ*) appear in Sagami Bay at depths which have not been determined. This occurrence is paralleled among the Cottoids (also a boreal group) in the appearance of the peculiar genera *Stlengis*, *Schmidtina*, and *Daruma* in Sagami and Suruga Bays, well to the southward of the area of common distribution of the northern genera. The cyclogasterids are represented farther to the south in Japanese waters by two forms, *Careproctus rhodomelas* and *Paraliparis atramentatus*, which were obtained along the margins of the Kuro Siwo at depths of 405 and 649 fathoms, and were taken with assemblages of forms belonging to a strictly tropical deep-sea fauna. A similar distribution is shown also in the eastern Pacific, where *Paraliparis* invades the deep waters of the Tropics, and is represented by several species which are strictly confined to the deep-sea tropical fauna.

There are here recorded from Japanese waters (including the Okhotsk Sea) 31 species of cyclogasterids, of which only 4 are known to extend their range as far as Bering Sea, and one of the four is a pelagic form of general distribution in the north Pacific. Bering Sea, on the other hand, has approximately 25 species which are unrecorded from the southwest. After making all necessary allowance for the imperfect surveys of these regions, it appears obvious

that so far as the cyclogasterids are concerned, a sharp line separates the fauna of Bering Sea from that of the Okhotsk and the seas to the south.

Within the Japanese area, while data are still incomplete, a faunal line of some value appears to separate the inclosed Sea of Japan (including the Gulf of Tartary) from the Okhotsk Sea and the eastern shores generally. As is shown in the following table of distribution, 12 species are recorded from the Sea of Japan and 24 species from the Okhotsk and the eastern shores of Hokkaido and Hondo; and but five of these are known to occur in both districts. Further exploration will increase the distribution of many of these species, but can hardly obliterate the faunal distinction which here seems apparent.

The types of the new species here described are all deposited in the United States National Museum.

The drawings are by Mr. W. S. Atkinson.

Table of distribution of Japanese Cyclogasterids.

[Names in brackets are of species previously known.]

Name.	Sea of Japan.	Okhotsk and eastern coast.	Bering Sea.	Depth.
1. <i>Cyclogaster curilensis</i>		×		Shore.
2. <i>Cyclogaster simushiræ</i>		×		Shore.
3. <i>Cyclogaster tessclatus</i>	×	×		61 to 150 fathoms.
4. <i>Cyclogaster [agassizii]</i>	×	×		Shore to 47 fathoms.
5. <i>Cyclogaster frenatus</i>	×			207 fathoms.
6. <i>Cyclogaster tanaka</i>	×	×		Unknown.
7. <i>Cyclogaster [owstoni]</i>		×		Unknown.
8. <i>Cyclogaster [ochotensis]</i>		×		21 to 75 fathoms.
9. <i>Cyclogaster ingens</i>	×			250 fathoms.
10. <i>Careproctus [cypselurus]</i>		×	×	510 fathoms.
11. <i>Careproctus castrinus</i>		×		73 to 119 fathoms.
12. <i>Careproctus acanthodes</i>	×			318 fathoms.
13. <i>Careproctus trachysoma</i>	×			243 to 429 fathoms.
14. <i>Careproctus rhodomelas</i>		×		405 to 507 fathoms.
15. <i>Careproctus pellucidus</i>		×		129 to 182 fathoms.
16. <i>Careproctus segaliensis</i>		×		119 fathoms.
17. <i>Careproctus bathycetus</i>		×		1,800 fathoms.
18. <i>Careproctus roseofuscus</i>		×		100 to 119 fathoms.
19. <i>Careproctus [colletti]</i>	×	×	×	390 to 440 fathoms.
20. <i>Careproctus sinensis</i>	×			200 fathoms.
21. <i>Careproctus pycnosoma</i>		×		229 fathoms.
22. <i>Careproctus curilanus</i>		×		229 fathoms.
23. <i>Careproctus homopterus</i>		×		440 fathoms.
24. <i>Careproctus entomelanus</i>	×			428 fathoms.
25. <i>Careproctus entargyreus</i>	×			35 to 66 fathoms.
26. <i>Crystallias [matsushimæ]</i>	×			52 to 200 fathoms.
27. <i>Paraliparis atramentatus</i>		×		649 fathoms.
28. <i>Paraliparis melanobranchus</i>		×		440 fathoms.
29. <i>Paraliparis entochloris</i>		×		100 fathoms.
30. <i>Rhinoliparis [barbulifer]</i>		×	×	192 to 359 fathoms.
31. <i>Nectoliparis [pelagicus]</i>		×	×	269 to 533 fathoms.

KEY TO JAPANESE SPECIES OF CYCLOGASTER.

a¹. Anterior portion of dorsal separated from remainder of fin by a deep notch.

b¹. Gill slit extending downward to opposite base of upper pectoral ray only; pyloric cæca about 70; diameter of disk half length of head; dorsal 34; anal 26; pectoral 29..... *curilensis*, 1.

b². Gill slit extending downward to opposite base of fourth pectoral ray; diameter of disk much less than half length of head; dorsal 44; anal 34; pectoral 40, *simushiræ*, 2.

a². Dorsal not notched anteriorly.

c¹. Last dorsal and anal rays not shortened to form a definite notch at union with caudal (sometimes one or both slightly shortened in *C. agassizii*).

d¹. Caudal broadly joined by basal half or three-fourths to dorsal and anal.

e¹. Gill slit very wide, reaching level of sixteenth pectoral ray; diameter of disk less than one-third length of head, widely separated from vent, which is nearer origin of anal fin; dorsal 48; anal 37; pectoral 35.....*tessellatus*, 3.

e². Gill slit narrower, reaching level of eighth or ninth pectoral ray; head very broad, depressed; eye very small, less than half interorbital width; diameter of disk nearly half head, separated from vent by its own diameter or more; dorsal 44; anal 34; pectoral 34.....*agassizii*, 4.

d². Caudal very narrowly joined to dorsal and anal, by not more than its basal fifth; head narrow, compressed; diameter of eye nearly three-fourths interorbital width; diameter of disk about two-fifths length of head, separated from vent by a distance less than its own diameter; dorsal 37; anal 31; pectoral 34.....*frenatus*, 5.

c². Last dorsal and anal rays shortened, forming a distinct notch at union with caudal.

f¹. Pectoral not notched (at least in adults).

g¹. Head flattened in the nasal region, snout low and projecting; gill slit reaching level of tenth or eleventh pectoral ray; dorsal and anal joined to basal two-thirds of caudal; diameter of disk less than half length of head, widely separated from vent, which is nearer origin of anal fin; dorsal 45; anal 34; pectoral 41.....*tanaka*, 6.

g². Head very convex and rounded in the nasal region; snout deep and short, not projecting; gill slit extending to level of tenth or eleventh pectoral ray; diameter of disk 2½ in head, widely separated from vent; dorsal 43; anal 36; pectoral 40.....*owstoni*, 7.

f². Pectoral notched; gill slit extending down to opposite sixteenth or eighteenth pectoral ray; diameter of disk less than half length of head, separated from vent by a distance about equaling its own diameter; dorsal 45 to 47; anal 36 or 37; pectoral 42.

h¹. Body stout, the depth 2.8 in length; jaws nearly equal; often with parallel black stripes; depth 40 to 75 fathoms.....*ochotensis*, 8.

h². Body slender, the depth 3.3 in length; upper jaw much projecting, exposing nearly all the upper teeth anteriorly; no black stripes; depth 250 fathoms.....*ingens*, 9.

1. *CYCLOGASTER (NEOLIPARIS) CURILENSIS*, new species.

Plate 41, fig. 1.

Type.—Cat. No. 73326, U.S.N.M. A female, 110 mm. in total length, from Milne Bay, Simushir Island, Japan.

Closely related to *C. callyodon*, from which it differs in the larger disk and the vent more posterior in position.

Measurements in hundredths of total length excluding the caudal fin: Length of head 29; greatest width of head 24.5; greatest depth of head opposite gill slit 22; greatest depth of body 25; depth of caudal peduncle 9; interocular width 10; diameter of eye 4; width at angles of mouth 15; distance from tip of snout to end of maxillary 12; length of gill slit 6; distance from tip of snout

to disk 17; to anus 38; diameter of disk 15; distance from disk to anus 7; anus to front of anal fin 15; length of longest pectoral ray 15; of longest ray of lower lobe 12; of shortest ray in notch 8.

Dorsal 34; anal 26; pectoral 29; pyloric cæca about 70.

Head and body as in *C. callyodon*; head depressed, the width greater than the depth; profile depressed above the eyes; maxillary reaching vertical from anterior half of eye; snout depressed; jaws about equal. Teeth as in *C. callyodon*, in about nine oblique rows in the half of each jaw. Anterior nostril in a prominent tube; posterior nostril with a raised rim, the anterior outer margin of rim raised to form a narrow pointed flap. Gill slit small, extending downward to opposite the base of the upper pectoral ray.

The anterior nine dorsal rays unsegmented, the first five set off by a notch. Caudal truncate, dorsal and anal connected to it slightly or not at all. Pectoral with a shallow notch, the lower lobe consisting of six rays, not reaching posterior margin of disk. Disk larger than in *C. callyodon*, its diameter slightly more than half length of head, equaling the distance from vent to front of anal fin. (Fig. 1.)

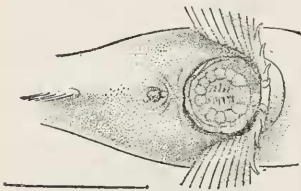


FIG. 1.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CYCLOGASTER CURILENSIS.

Coloration resembling that of *C. callyodon*, but with the bars on fins and body often more pronounced and the spotted coloration sometimes seen in *C. callyodon* wholly lacking. Dark above, with an indistinct mottling of slate and ashy gray, the lower surfaces paler; pectorals with two or three dusky cross-bars; dorsal with twelve dusky bars, the posterior nine or ten extending across the body and on the anal fin; caudal with three or four irregular bars; in many specimens the bars are present only on the fins, leaving the body a uniform olive brown or slate color, and in some individuals even the bars on the fins are very indistinct or wanting.

In addition to the type, 31 specimens were taken in the tide pools at Milne Bay, Simushir Island.

2. CYCLOGASTER (NEOLIPARIS) SIMUSHIRÆ, new species.

Plate 41, fig. 2.

Type.—Cat. No. 73327, U.S.N.M. A male, 138 mm. in total length, from Milne Bay, Simushir Island, Japan.

Closely related to *C. greenei*, differing in the more numerous fin rays, in the shape of the head and body, and in the vent being nearer the disk!

Measurements in hundredths of length exclusive of caudal fin (120 mm.): Length of head 29.5; depth opposite front of disk 18.5; depth opposite gill slit 25; greatest width of head 24; greatest depth of body 25; depth of caudal peduncle 7; interocular width 12.5;

diameter of eye 4; width at angles of mouth 17.5; distance from tip of snout to end of maxillary 15; length of gill slit 7.5; distance from tip of snout to disk 18; to anus 38; diameter of disk 11; distance from disk to anus 9.5; from anus to front of anal fin 9.5; length of longest pectoral ray 16.5; of shortest ray in notch 8.

Dorsal 44; anal 34; pectoral 40.

Body deepest in front of dorsal, tapering rapidly backward from middle of second dorsal. Head thick, only moderately depressed, its width greater than its depth; cheeks swollen; maxillary reaching vertical from posterior margin of eye; anterior nostril in a thick tube; posterior nostril without a tube. Teeth weakly trilobed, in about ten oblique rows in the half of each jaw. Gill slit extending down in front of four pectoral rays.

First seven dorsal rays separated off by a deep notch; caudal truncate; anal joined to caudal for not more than one-seventh of the length of the caudal; dorsal only slightly connected to the caudal; pectoral notched, the lower lobe consisting of seven rays and extending slightly past disk. Vent separated from disk by diameter of disk.

Color olive brown above and on sides, paler below; fins unmarked, colored the same as the body.

In addition to the type, two young cotypes 28 mm. long were obtained in the same locality. In these the vent is much farther back, almost immediately in front of the origin of the anal. One of the cotypes has large scattered papillæ, most numerous on upper anterior part of trunk. These may develop "thumb-tacks" in adults.

3. CYCLOGASTER TESSELLATUS, new species.

Plate 41, fig. 3.

Type.—Cat. No. 73328, U.S.N.M., a male, 186 mm. long, from station 5042, off the southeast coast of Hokkaido, west of Erimo Saki; depth 61 fathoms.

Measurements in hundredths of total length exclusive of caudal fin (158 mm.): Length of head 26; depth opposite front of disk 16; opposite gill slit 20; greatest width of head 17.5; greatest depth of body 23; depth of caudal peduncle 3; interocular width 11.5; diameter of eye 4.5; width at angles of mouth 12.5; distance from tip of snout to end of maxillary 13; length of gill slit 11.5; distance from tip of snout to disk 15; to anus 37; diameter of disk 8; distance from disk to anus 14; from anus to front of anal fin 4.5; from tip of snout to front of dorsal 28; longest pectoral ray 24; longest ray of lower lobe 18; shortest ray in notch 11.

Dorsal 48; anal 37; pectoral 35.

Body elongate, slender. Head pointed, broad and flat between the eyes; occiput not swollen; depth of head greater than width. Snout depressed, rising gradually, projecting beyond the premaxil-

larvae for nearly the diameter of the eye; lower jaw included; anterior nostril in a very short tube; posterior nostril reduced to a small pore; maxillary reaching vertical from middle of eye. Teeth in moderate bands, arranged in about fifteen oblique rows in the half of the lower jaw and twenty in the half of the upper. Gill opening large, extending down in front of sixteen pectoral rays. Caudal elongate, slightly rounded, joined to dorsal and anal for three-fourths its length, the rays evenly graduated, the union without notch. Pectoral notched, the lower lobe consisting of five rays and reaching more than half way from disk to vent. Disk rather small, widely separated from the vent, which is but little in advance of the origin of the anal. (Fig. 2.)

Top and sides of head and body dusted and marbled with dark brown; abdomen and throat pale or pinkish; pectoral a little darker than the body, with irregular dusky bars above; anterior margin of dorsal with dark blotches; posteriorly these are replaced by dark bars

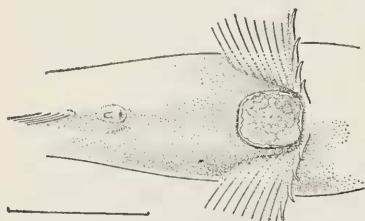


FIG. 2.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CYCLOGASTER TESSELLATUS.

which zigzag obliquely downwards across the fin; anal a little darker than dorsal, crossed by about seven pairs of narrow dusky bars, inclosing each a wider light bar; caudal with three oblique bars; peritoneum silvery, with dark spots.

Resembling *C. pulchellus* in the wide connection between the vertical fins, but the gill slit much wider.

In addition to the type, two cotypes were taken at station 5041 in the same locality, at a depth of 140 fathoms; and one at station 4867, in the Sea of Japan, off the coast of Korea, depth 150 fathoms.

4. CYCLOGASTER AGASSIZII (Putnam).

Liparis agassizii PUTNAM, Proc. Amer. Ass. Adv. Sci., 1874, p. 339 (Gulf of Tartary).

Abundant in tide pools and along shore throughout northern Japan. It was taken but once with the dredge, at station 4808, Straits of Tsugaru, Japan, at a depth of 47 fathoms. Like many other northern shore forms, its southern distribution is determined by that of the cold current, which can be detected a little beyond Matsushima Bay.

5. CYCLOGASTER FRENATUS, new species.

Plate 42, fig. 1.

Type.—Cat. No. 73329, U.S.N.M., 94 mm. long, from station 4809, in the Sea of Japan, off the northwest coast of Hondo; depth 207 fathoms.

Measurements in hundredths of total length, exclusive of caudal fin (78 mm.): Length of head 25; depth opposite front of disk 14.5; opposite gill slit 20; greatest width of head 18; greatest depth of body

25; depth of caudal peduncle 6; interocular width 8; diameter of eye 5.5; width at angles of mouth 11; distance from tip of snout to end of maxillary 9; length of gill slit 8; distance from tip of snout to disk 14; to anus 32.5; diameter of disk 10; distance from disk to anus 7; from anus to front of anal fin 15; distance from tip of snout to front of dorsal 32; longest pectoral ray of upper lobe 17; of lower lobe 17; shortest ray in notch 10.

Dorsal 37; anal 31; pectoral 34.

Body not deep, compressed. Head rather slender and pointed, compressed; interorbital flat; cheeks not swollen; sides of head nearly vertical. Mouth small, narrow, with little lateral cleft; maxillary reaching vertical from front of eye. Teeth stout, strongly trilobed, about eight rows in the half of each jaw. Snout rather deep, slightly overlapping the mouth. Posterior nostril with a raised rim, which is produced into a short flap in front; anterior nostril in a long tube, which when depressed nearly reaches posterior nostril. Gill opening extending down in front of the upper nine pectoral rays.

Anterior dorsal rays rather stiff, the first six unsegmented. Caudal truncate, consisting of ten stout rays; dorsal and anal connected to caudal for a short distance, the anal connection a little greater than the dorsal; last rays of dorsal and anal connected to their tips to the caudal. Disk rather small, with a broad flap. Vent close behind disk, distant from it less than the diameter of the disk. Pectoral notched, the lower lobe of seven rays, its tip reaching vent.

Coloration: Skin with fine dark brown dots, more numerous on the top of the head, absent from the abdomen; a dark streak running forward and downward from the eye; dark spots extending backward from end of maxillary; pectoral with a broken dark bar near base, the remainder of fin pale; about seven faint dusky bars on dorsal and anal, the posterior bars extending farther on peduncle; a narrow black bar across base of caudal, a second, less marked, two-thirds the distance to the tip. In life, the fins and the lower jaw light red, the body grayish.

Apparently related to *C. cyclopus*, but not closely so, and easily distinguished by the shape of the head and the number of the fin rays.

Only the type taken.

6. CYCLOGASTER TANAKÆ, new species.

Plate 42, fig. 2.

Liparis oustoni TANAKA, Journ. Sci. Coll. Imp. Univ. Tokyo, vol. 23, 1908, p. 45, pl. 3, fig. 2; not *Trismegistus oustoni* Jordan and Snyder.

Type.—360 mm. long, from Vries Island, Sagami Sea, Japan. Presented to Stanford University by Shigeho Tanaka, of the Imperial University of Japan.

Measurements in hundredths of total length exclusive of caudal fin: Length of head 28; depth opposite gill slit 22; greatest width of

head 22; greatest depth of body 24; depth of caudal peduncle 4.5; interocular width 13; diameter of eye 3; width at angles of mouth 18; distance from tip of snout to end of maxillary 14; length of gill slit 10.5; distance from tip of snout to disk 13; to anus 39; diameter of disk 11.5; distance from disk to anus 15; from anus to front of dorsal 31; longest pectoral ray 25; longest ray of lower lobe 15; shortest pectoral ray 15.

Dorsal 45; anal 34; pectoral 41.

Body heavy anteriorly, not very deep. Head broad and depressed, about as broad as deep, nearly quadrate in cross section; profile almost straight from occiput to snout. Snout depressed, broadly rounded; upper jaw projecting so that the upper band of teeth is partly exposed. Eye very small. Anterior nostril in a short thick tube, posterior with a slightly projecting rim. Mouth very broad, its angle behind vertical from anterior nostril; maxillary reaching vertical from middle of eye. Teeth strongly trilobed, in about 30 oblique rows in the half of the upper jaw; outer teeth smaller and not so strongly trilobed. Gill slit extending down in front of 11 pectoral rays.

Caudal slightly rounded, the dorsal and anal joined with its basal two-thirds, the last dorsal and anal rays shortened, forming rounded lobes. Pectoral broad, not notched, the lower lobe broadly rounded, its upper rays not shortened. Disk large, oval, its anterior edge below the eye. Vent far back, nearer anal fin than disk.

Coloration: Pale gray with dusky mottlings and stripes along base of dorsal and top of body; margin of dorsal, anal, pectoral, and the caudal dusky; posterior surface of pectoral dusky; free tips of all rays whitish; a white line where the skin of the body is firmly attached to the vertical fins, this most pronounced on the caudal.

Thumb-tack prickles on the top and sides of head and body, apparently absent on throat and abdomen.

C. tanakæ can be distinguished from *C. owstoni* by the broad depressed snout. They both agree in the character of the caudal and pectoral fins, which distinguish them from the other species of the genus.

Five specimens of this species were in the collections of the Imperial University of Japan, three of these from the vicinity of Vries Island, Sagami Sea, taken in the spring of 1906, the other two probably from the same locality. An additional specimen has been recently taken at Fusan, Korea, by Dr. David Starr Jordan.

7. CYCLOGASTER OWSTONI (Jordan and Snyder).

Trismegistus owstoni JORDAN and SNYDER, Smiths. Misc. Coll., vol. 45, 1904, p. 238, pl. 58 (Sagami Bay).

No additional specimens were secured of this interesting species, which is known only from the type, and from a specimen from the market at Nagasaki recorded by Schmidt.¹

¹ Proc. U. S. Nat. Mus., vol. 28, 1904, p. 189.

8. CYCLOGASTER OCHOTENSIS (Schmidt).

Plate 42, fig. 3.

Liparis ochotensis SCHMIDT, Pisces Marium Orientalium, 1904, p. 163 (Okhotsk Sea).

The following description will serve for comparison with other allied species of our collection:

Head 3.3 in length; depth 2.8. Dorsal 45; anal 36; pectoral 42. Eye 8.8 in head; snout 2.6; gill slit 2.2; disk 2.5; pyloric caeca 23.

Body heavy and deep anteriorly, tapering rapidly to the caudal, the greatest depth at shoulders. Head short and deep, the occiput slightly swollen, the profile steep; interorbital space broad; the distance between the anterior nostrils contained 3.6 times in the head. Snout short and broad, rising abruptly; jaws equal. Anterior nostrils in a prominent tube; posterior nostril with a raised rim. Eye small, round. Mouth broad; maxillary reaching vertical from just behind the eye. Teeth slender, weakly trilobed, in a broad band, arranged in about 25 oblique rows in the half of each jaw, those of the anterior series minute. Gill slit broad, extending down in front of 18 pectoral rays.

Anterior dorsal rays buried in a gelatinous tissue; distance from tip of snout to dorsal 2.8 in body. Caudal broad, slightly rounded. Dorsal and anal joined to basal half of caudal, the anal a little more widely joined than the dorsal; last rays of both dorsal and anal shortened, forming rounded lobes, pectoral broad, notched; the lower lobe thickened, with partly free rays reaching two-thirds the distance from disk to vent. Disk nearly round; distance from tip of lower jaw to disk 8.4 in length; from disk to origin of anal 4.8. Vent separated from disk by a little less than diameter of disk.

Coloration: Top of head and sides and back of body with bluish black stripes, these darker along the edges and sometimes dividing posteriorly to form two stripes; lower parts of body pale; margin of pectoral, dorsal, and anal bluish black; caudal blackish; lower lobe of pectoral not so dark as the upper.

Thumb-tack prickles on top of head and on back; those on sides smaller; lower surfaces smooth.

This species differs from *C. agassizii* in the increased number of pectoral rays. The description is from a female specimen 465 mm. long, from station 5008, in Aniva Bay, Sagalin Island, at a depth of 40 fathoms. Young specimens were taken in the same locality at stations 5010 and 5012, depths 21 and 42 fathoms; and others from stations 5016, 5017, 5020, 5021, and 5023, off the eastern coast of Sagalin, at depths of 64 to 75 fathoms.

As in certain other species of the genus, *C. ochotensis* displays distinct color patterns. Certain of our specimens are conspicuously marked with longitudinal black streaks, others with light blotches of varying size and shape, narrowly margined with dusky, while the majority are gray, finely spotted or variegated with darker.

9. CYCLOGASTER INGENS, new species.

Plate 43, fig. 1.

Type.—Cat. No. 73330, U.S.N.M. A male, 490 mm. long, from station 4863, off the coast of Korea, in the Sea of Japan; depth 250 fathoms.

Measurements in hundredths of total length, excluding the caudal fin (410 mm.): Length of head 31.5; depth opposite front of disk 25.5; opposite gill slit 30; greatest width of head 24.5; greatest depth of body 30; depth of caudal peduncle 4; interocular width 12; diameter of eye 3; width at angles of mouth 18.5; distance from tip of snout to end of maxillary 16.5; length of gill slit 14; distance from tip of snout to disk 18.5; to anus 38.5; diameter of disk 11; distance from disk to anus 9.6; from anus to front of anal fin 8.5; from tip of snout to front of dorsal 34; longest pectoral ray 22; longest ray of lower lobe 18; shortest ray in notch.

Dorsal 45; anal 37; pectoral 42.

Body deepest at union with head, rather elongate and weak posteriorly and much compressed; head heavy, occiput swollen, profile rising very obliquely from snout; cheeks slightly swollen; snout short, deep, rising abruptly; upper jaw projecting so that nearly all the upper teeth are exposed; anterior nostril in a short wide tube; eye small; mouth wide; maxillary reaching vertical from slightly behind eye; posterior teeth slender, depressible and weakly trilobed, the anterior teeth becoming progressively smaller, those along the front of each jaw extremely minute; about 20 oblique rows in the half of the lower jaw and 30 in the upper. Gill slit wide, extending down in front of 16 pectoral rays.

Origin of dorsal slightly behind tip of gill flap. Caudal injured, its union with dorsal and anal apparently equal to half or more than half of its length. Pectoral notched, the lower lobe reaching two-thirds the distance from the disk to the vent. Disk rather large, separated from vent by a distance nearly equal to its own diameter.

Body and vertical fins dusky, with bluish black mottlings; margin and posterior surface of head and body pale.

Minute thumb-tack prickles sparsely distributed on top of head, on dorsal fin, and on sides of body; lower parts, including anal fin and a strip along its base, the terminal part of snout, lower part of cheeks and opercles, the pectoral fin and its axil naked.

This species differs from *C. ochotensis* in having a shorter jaw and a longer slenderer body. It appears to have more oblique series of teeth in the upper jaw than in the lower (30–20), while *C. ochotensis* has about the same number (25) in each jaw; but this may have little significance, as in these species the total number of rows in adults has been increased by the more or less irregular intercalation of secondary rows. *Ingens* is a deep-water species (250 fathoms) from off the Korean coast. The form is more slender and the texture less

firm than in *C. ochotensis*, which is a sublittoral species known only from Sagalin. In other structural details, the two species agree closely.

Only the type known.

KEY TO JAPANESE SPECIES OF CAREPROCTUS.

- a*¹. Caudal deeply and sharply forked *cypselurus*, 10.
*a*². Caudal not deeply forked—either gently concave, truncate, or convexly rounded.
*b*¹. Head and body rough with thick-set multifid prickles.
*e*¹. Length of head more than one-fourth the total length; peritoneum silvery, not dotted with black.
*d*¹. Diameter of disk about one-tenth length of head; body slender, its depth much less than one-third the total length.....*rastrinus*, 11.
*d*². Diameter of disk about one-sixth length of head; body deeper, its depth much more than one-third the total length*acanthodes*, 12.
*e*². Length of head less than one-fourth the total length; diameter of disk about one-ninth the length of head; body slender, the depth less than one-third the total length.....*trachysoma*, 13.
*b*². Head and body smooth, or with widely scattered simple prickles.
*e*¹. Gill slit extending below level of upper pectoral ray.
*f*¹. Teeth coarse, trilobed; gill slit extending to opposite third pectoral ray.....*rhodomelas*, 14.
*f*². Teeth simple; gill slit extending to opposite fifth or sixth pectoral ray.
pellucidus, 15.
*e*². Gill slit usually confined to area above base of pectoral, rarely extending to level of first or second pectoral ray.
*g*¹. Diameter of ventral disk less than one-fourth length of head.
*h*¹. Teeth trilobate, some of the outer teeth simple; in life, transparent, with a reddish tinge, slightly dusky posteriorly; lower pectoral lobe short.....*segaliensis*, 16.
*h*². Teeth simple.
*i*¹. Uniform jet-black, including gill cavity and peritoneum; distance from disk to anus nearly twice the diameter of disk.
bathycætus, 17.
*i*². Not wholly black.
*k*¹. Distance from disk to anus slightly greater than diameter of disk; lower lobe of pectoral scarcely reaching vent.
roscofuscus, 18l
*k*². Distance from disk to anus half diameter of disk; lower pectoral lobe long, extending beyond origin of anal fin....*colletti*, 19.
*g*². Diameter of ventral disk more than one-fourth length of head.
*l*¹. Teeth trilobate (weakly so in *C. sinensis*).
*m*¹. Body deep and compressed, the depth more than one-fourth the length; texture somewhat gelatinous.
sinensis, 20.
*m*². Body elongate, the depth not exceeding one-fifth the length.
*n*¹. Head more than one-fourth the length....*pycnosoma*, 21.
*n*². Head less than one-fourth the length....*curilanus*, 22.
*l*². Teeth simple (a few with weak lobes in *C. homopterus*).
*o*¹. Pectoral indistinctly notched, none of the lower rays extending beyond the disk.....*homopterus*, 23.
*o*². Pectoral distinctly notched, with well-developed lower lobe.
*p*¹. Peritoneum jet black.....*entomelas*, 24.
*p*². Peritoneum silvery, with scattered black dots.
entargyreus, 25.

10. CAREPROCTUS CYPSELURUS (Jordan and Gilbert).

Prognurus cypselurus JORDAN and GILBERT, Fishes of Bering Sea. Report Fur-Seal Investigations, Part 3, 1899, p. 478, pl. 77 (Bering Sea).

One specimen 260 mm. in length from station 5015, in the southern part of the Okhotsk Sea, at a depth of 510 fathoms.

Color in life: Greater part of head, body, and fins deep purplish indigo, the anterior part of the sides almost clear red, with little blue; head again becoming deeper blue, but with more red than the posterior part of the trunk; basal portion of upper pectoral rays also with more reddish.

11. CAREPROCTUS RASTRINUS, new species.

Plate 43, fig. 2.

Type.—Cat. No. 73331, U.S.N.M. A female, length 285 mm. long, from station 5026, in the southern part of the Okhotsk Sea, depth 119 fathoms.

Measurements in hundredths of length without caudal (259 mm.): Length of head 27.5; greatest width of head 17.5; interocular width

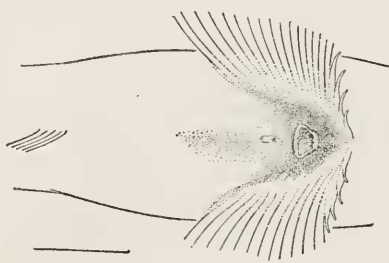


FIG. 3.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CAREPROCTUS RASTRINUS.

16; width at angles of mouth 15; distance from tip of snout to front of orbit 11; diameter of eye 5.5; distance from tip of snout to end of maxillary 14; length of gill slit 8; greatest depth of body 42; distance from tip of snout to front of disk 14; to anus 17.2; to front of anal fin 38; to front of dorsal 29.5; diameter of disk 2.5; distance from disk to anus 2; longest pectoral ray

of upper lobe 15; of lower lobe 29; shortest ray 8.

Dorsal 59; anal 52; pectoral 37; caudal 8; pyloric caeca 34.

Body heavy and deep anteriorly, compressed, tapering rapidly to caudal. Head short, with short blunt snout; profile evenly rounded, the anterior profile of snout vertical; interorbital wide, nearly thrice eye; cheeks vertical; jaws equal; nostril in a short wide tube on lower line of eye. Mouth wide; maxillary reaching vertical from slightly behind eye. Teeth stout, blunt, simple, arranged in about 11 oblique rows in the half of each jaw. Gill slit extending down in front of four or five pectoral rays.

Origin of dorsal far forward, a little in front of gill slit. Caudal broad, slightly rounded, joined to anal a little more than half its length; no dorsal or anal notch. Pectoral deeply notched; the upper lobe reaching past front of anal; the lower lobe of eight greatly exerted rays, the longest reaching front of anal and nearly as long as head

(shorter in cotypes). Disk small, broadly triangular in the adult, this scarcely evident in the younger cotypes; vent close behind disk. (Fig. 3.)

Multifid prickles scattered thickly over head and body.

Color in life, light yellowish pink or salmon color, nearly white on belly and under side of head; peritoneum silvery.

This species is not closely related to the other species of the genus; it is readily distinguished by the short heavy head and body and the coloration.

Two cotypes from station 5021, off Cape Patience, Sagalin, depth 73 fathoms.

12. CAREPROCTUS ACANTHODES, new species.

Plate 43, fig. 3.

Type.—Cat. No. 73332, U.S.N.M. A female, 89 mm. long, from station 4997, in the Gulf of Tartary; depth 318 fathoms.

Measurements in hundredths of length without caudal (81 mm.): Length of head 29.5; greatest width of head at cheeks 17; interocular width at angles of mouth 15.5; distance from tip of snout to front of orbit 12.5; diameter of eye 8; distance from tip of snout to end of maxillary 12.5; length of gill slit 5.8; greatest depth of body 27; distance from tip of snout to front of disk 12.8; to anus 17; to front of anal fin 35; to front of dorsal 28; diameter of disk 5; distance from disk to anus 1.3; longest pectoral ray of upper lobe 21.5; of lower lobe 12.8; shortest ray in notch 5.5.

Dorsal 53; anal 46; pectoral 33; pyloric caeca 19.

Body moderately deep, compressed, much more elongate than in *C. rastrinus*. Head very wide, blunt and heavy, cheeks vertical, interorbital broad and flat. Snout short, wide, and deep, scarcely protruding; jaws equal; nostril in a short broad tube in front of lower edge of pupil; eye moderate, the lower half silvery. Mouth broad; maxillary reaching vertical from posterior margin of pupil. Teeth short, simple, arranged in 10 or 11 oblique rows in the half of each jaw. Gill slit extending down in front of upper pectoral ray, or in some cases confined to area above base of fin, this variation apparently due to looseness of the integument.

Origin of dorsal above tip of gill flap; anterior dorsal rays buried in a gelatinous tissue. Caudal truncate, joined to anal for nearly half its length; no dorsal or anal notch. Pectoral notched, the upper lobe reaching past front of anal; lower lobe of six rays, short, reaching

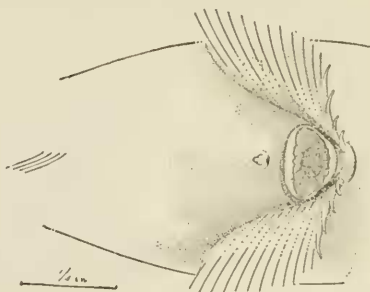


FIG. 4.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CAREPROCTUS ACANTHODES.

little past vent. Disk small, deeply cupped, appearing somewhat triangular in the larger individuals; vent close behind disk. (Fig. 4.)

Multifid prickles scattered over head and body, absent on lips and chin, few or none near the caudal.

Skin transparent, finely dusted with dark brown dots, body dusky along the back, abdomen silvery, lower half of eye and peritoneum silvery.

In appearance this species resembles *C. trachysoma*, but can be distinguished by the color of the peritoneum, the shorter pectoral lobe, and the larger disk.

Four cotypes were taken with the type.

13. CAREPROCTUS TRACHYSOMA, new species.

Plate 44, fig. 1.

Type.—Cat. No. 73333, U.S.N.M. A male, 266 mm. long, from station 4982, in the northern part of the Japan Sea; depth 390 fathoms.

Measurements in hundredths of length without caudal (243 mm.): Length of head 22.2; greatest width of head at cheeks 14; interocular

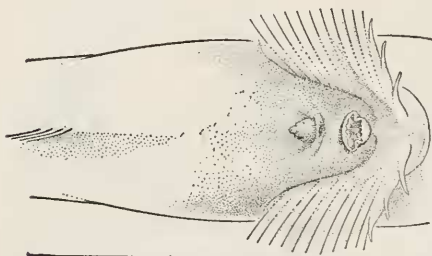


FIG. 5.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CAREPROCTUS TRACHYSOMA.

width 12; width at angles of mouth 11; distance from tip of snout to front of orbit 7.1; diameter of eye 5; distance from tip of snout to end of maxillary 11; length of gill slit 6.5; greatest depth of body (not including vertical fins) 30; distance from tip of snout to front of anal fin 32.5; to front of disk 11.3; to anus 14.5; to front of dorsal

25.5; diameter of disk 2.3; distance disk to anus 1.5; longest pectoral ray of upper lobe 16; of lower lobe 23; shortest ray in notch 8.

Dorsal 60; anal 55; pectoral 31 (fin counts from cotype).

Body deep and compressed. Head short, deep, compressed, the anterior profile steep, the sides vertical. Snout short, blunt, rising rapidly, not projecting; upper jaw slightly protruding beyond the lower; nostril in a short tube in front of eye, below level of pupil. Mouth broad, with considerable lateral cleft, the maxillary reaching vertical from behind pupil. Teeth simple, short, in narrow bands. Gill slit extending down in front of five pectoral rays in type; in some of the cotypes not extending down so far in front of the fin.

Origin of dorsal above opercular flap, the rays increasing gradually in length and buried in a gelatinous tissue. Caudal truncate or slightly rounded, of eight rays, joined to anal for nearly half its length; dorsal and anal connected to caudal abruptly, but there is no

notch between the fins. Pectoral notched, the upper lobe reaching third anal ray; lower lobe of eight rays, elongate, reaching nearly to anal, in adults greater than length of head, in young a little less than head. Disk small, hidden beneath the lower pectoral lobes; in adults the posterior and anterior parts of the flap are folded over the base of the disk, so that the width appears greater than the length. Vent close behind disk. (Fig. 5.)

Multifid prickles scattered thickly over head and body, with the exception of the lips and chin; usually about 10 slender prickles clustered about a single base. (Fig. 6.)

Color dusky, faintly pinkish in life, darker on top of head in the type; dorsal and anal posteriorly and the caudal bluish black; pectoral dusky except at base; skin everywhere dusted with fine dark dots; peritoneum silvery, with fine dark dots.

Twelve cotypes were taken from the following stations:

	Fathoms.
4814. Off Sado Island, Sea of Japan.....	429
4981. Shiruunku Bay, west coast Hokkaido.....	406
4982. Shiruunku Bay, west coast Hokkaido.....	390
4983. Shiruunku Bay, west coast Hokkaido.....	428
4992. Off the northwest coast of Hokkaido.....	325
4997. Gulf of Tartary.....	318

Differing from *C. rastrinus* conspicuously in the shorter head, the slenderer form, and the darker coloration.

14. CAREPROCTUS RHODOMELAS, new species.

Plate 44, fig. 2.

Type.—Cat. No. 73334, U.S.N.M. A male, 123 mm. long, from station 4958, off the Bungo Channel, Japan; depth 405 fathoms.

Measurements in hundredths of length without caudal (113 mm.): Length of head 19; greatest width of head 14; interocular width 10; width at angles of mouth 8.5; distance from tip of snout to front of orbit 6; diameter of eye 5.5; distance from tip of snout to end of maxillary 8; length of gill slit 5; greatest depth of body 19; distance from tip of snout to front of disk 11.5; to anus 17; to front of anal fin 34; to front of dorsal 23; diameter of disk 3; distance from disk to anus 4; longest pectoral ray of upper lobe 15, of lower lobe 21; shortest ray in notch 4.

Dorsal 56; anal 48; pectoral 31 (from cotype); caudal 9.

Body elongate, slender, compressed, tapering very gradually to the caudal. Head short, flat on top, the sides vertical; interorbital wide; occiput slightly swollen. Snout short and deep, not projecting; nostril in a short tube in front of upper part of eye; mouth



FIG. 6.—SECTION OF SKIN OF CAREPROCTUS TRACHYSOMA SHOWING MULTIFID PRICKLES.

broad, maxillary reaching vertical from middle of eye. Teeth very coarse, trilobed, the lateral lobes stout, nearly as long as the middle lobe, the teeth arranged in broad bands, not decreasing regularly in size outward; eight or nine oblique series in half of either jaw. Gill opening extending down in front of three pectoral rays (in cotype, the type mutilated).

Origin of dorsal slightly behind base of pectoral; the anterior rays increasing gradually in length. Caudal rather slender, the tips of the rays coiled and apparently free, its union with anal equal to one-third its length. Pectoral notched, the lower lobe elongate, longer than the upper lobe, reaching nearly to the anal. Disk small, triangular in shape, the flap narrow, but little developed on the sides anteriorly. (Fig. 7.)

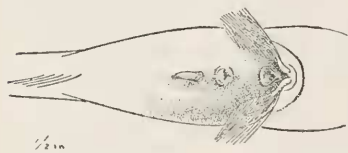


FIG. 7.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CAREPROCTUS RHODOMELAS.

Color in spirits, dusky, jet black anteriorly, where the peritoneum and lining of the gill cavity show through. In life, the head, body, and fins rose red or brick red, brighter anteriorly, except where underlaid by black. Pectoral blackish on inner face proximally.

A well-marked species, distinguished in part by the very coarse teeth and the elongate lower lobe of the pectoral.

A single cotype from station 4980, south of Suruga Bay; depth 507 fathoms.

15. CAREPROCTUS PELLUCIDUS, new species.

Plate 44, fig. 3.

Type.—Cat. No. 73335, U.S.N.M. Female, 127 mm. in total length, from station 5048, off Matsushima Bay, east coast of Hondo; depth 129 fathoms.

Measurements in hundredths of length without caudal (115 mm.): Length of head 27; greatest width of head 17; interocular width 17; width at angles of mouth 14; distance from tip of snout to front of orbit 10; diameter of eye 7; distance from tip of snout to end of maxillary 15; greatest depth of body 31; length of gill slit 8; distance from tip of snout to front of disk 16; to anus 20; to front of anal fin 36; to front of dorsal 27; diameter of disk 4; distance from disk to anus 3; longest pectoral ray of upper lobe 16, of lower lobe 24; shortest ray in notch 7.

Dorsal 55; anal 49; pectoral 35; pyloric caeca 18.

Body deep, compressed, short; greatest depth under origin of dorsal. Head wide, flat above, the sides vertical. Snout short, rising abruptly, slightly overlapping the mouth; lower jaw included; nostril in a prominent tube; eye large and prominent. Mouth wide, angle of mouth behind front of eye; maxillary reaching vertical from just in front

of posterior margin of eye. Teeth simple, rather stout, and slightly curved backward, in about 10 oblique rows. Gill slit extending down in front of the upper five or six pectoral rays.

Origin of dorsal far forward, a little in front of gill slit, the anterior rays buried in a pseudotissue. Caudal truncate, joined to dorsal and anal for two-fifths its length, the posterior line of union abrupt but without notch. Pectoral deeply notched; the lower lobe long, of eight deeply exerted rays which reach nearly to anal fin. Base of upper pectoral ray in axis of body, which passes just below eye. Disk small, triangular, separated from vent by slightly less than its diameter. (Fig. 8.)

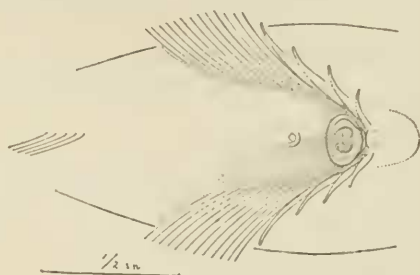


FIG. 8.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CAREPROCTUS PELLUCIDUS.

Color pale, skin transparent in life, tinged with light rose; dark brown dots on body and vertical fins; peritoneum pale.

One cotype from station 5048 and five from station 5049, off Matsushima Bay, east coast of Hondo, in 129 and 182 fathoms.

16. CAREPROCTUS SEGALIENSIS, new species.

Plate 45, fig. 1.

Type.—Cat. No. 73336, U.S.N.M. 75 mm. in total length, from station 5026, Okhotsk Sea, off the southern part of Sagalin Island, in the vicinity of Cape Patience; depth 119 fathoms.

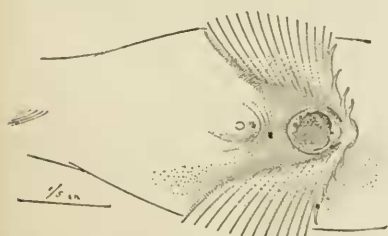


FIG. 9.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CAREPROCTUS SEGALIENSIS.

Measurements in hundredths of total length excluding the caudal fin (69 mm.): Length of head 22.5; greatest width of head 14; interocular width 12; width at angles of mouth 8.5; distance from tip of snout to front of orbit 10; diameter of eye 5; length of gill slit 3.8; greatest depth of body 24; distance from tip of snout to front of disk

12.5; to anus 18.5; to front of anal 33; to front of dorsal 28; diameter of disk 4.3; longest pectoral ray of upper lobe 18; of lower lobe 9.5; of shortest ray in notch 7.

Dorsal 58; anal 52; pectoral 25.

Body deep and compressed, as in *C. mirabilis*. Head compressed, sides nearly vertical; profile descending in an even curve; snout not split, projecting beyond upper lip for two-thirds diameter of eye; nostril in a short tube; eye small. Mouth small and narrow; maxillary reaching vertical from pupil. Teeth in broad bands, slender,

with well developed lateral lobes; outer teeth smaller, bluntly pointed and without lateral lobes. Gill slit very narrow, wholly confined to area above pectoral fin.

Anterior dorsal rays free from the skin, enveloped in a pseudotissue. Caudal injured in the type, apparently truncate, of about five rays; anal joined to basal third of caudal; dorsal and anal joining caudal without notch. Pectoral slightly notched, the lower lobe of five rays below notch, the rays short, the longest reaching slightly past vent. Disk rather small, the vent close behind it. (Fig. 9.)

In life transparent, with a reddish tinge, slightly dusky posteriorly, the flesh pinkish.

Resembling *C. mirabilis* in shape of head and body, but distinguished by the number of pectoral rays and the coloration and in the absence of the deep cleft on the snout.

Only the type taken.

17. *CAREPROCTUS BATHYCÆTUS*, new species.

Plate 45, fig. 2.

Type.—Cat. No. 73337, U.S.N.M. A female, 181 mm. long, from station 5030, in the southern part of the Okhotsk Sea, depth 1,800 fathoms.

Measurements in hundredths of length without caudal (163 mm.): Length of head 21; greatest width of head 14; interocular width 9;

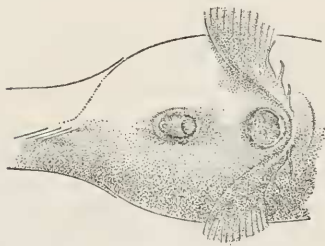


FIG. 10.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF *CAREPROCTUS BATHYCÆTUS*.

width at angles of mouth 11.5; distance from tip of snout to front of orbit 8; diameter of eye 4.2; distance from tip of snout to end of maxillary 9.2; length of gill slit 5.5; greatest depth of body 17.5; distance from tip of snout to front of disk 13; to anus 21; to front of anal fin 29.5; to front of dorsal 23; diameter of disk 3; distance from disk to anus 5.5; longest pectoral ray of upper lobe 15; of

lower lobe 15; shortest ray in notch 3.5.

Dorsal 61; anal 55; pectoral 23; pyloric cæca 9.

Body deepest at front of dorsal, greatly compressed and rapidly tapering posteriorly. Head short and heavy; occiput slightly swollen; a low median interorbital ridge; width and depth of head about equal. Snout moderately deep, truncate, projecting slightly beyond mouth; nostril in front of middle of eye, provided with a raised rim. Mouth wide, maxillary reaching vertical from posterior margin of pupil. Teeth rather long and slender, somewhat curved, all simple, without trace of lateral lobes, arranged in about 12 oblique rows in the half of each jaw. Gill opening not extending below upper pectoral ray.

Dorsal origin above tip of opercular flap. Caudal slender, apparently with six rays, joined to anal for about one-third its length. Pectoral notched; the lower lobe of six rays reaching halfway between vent and anal. Disk small, rather deeply cupped, placed behind vertical from posterior margin of eye. (Fig. 10.)

Color uniform jet black; mouth dusky; gill cavity and peritoneum also black.

A deep-sea species related to *C. colletti*, distinguished among other characters by the small number of rays in the pectoral fin.

Only the type known.

18. CAREPROCTUS ROSEOFUSCUS, new species.

Plate 45, fig. 3.

Type.—Cat. No. 73338, U.S.N.M. Ninety-one mm. long, from station 5026, off the southeastern part of Sagalin Island, vicinity of Cape Patience; depth 119 fathoms.

Measurements in hundredths of total length exclusive of caudal fin (81 mm.): Length of head 26; greatest width of head 18; interocular width 12; width at angles of mouth 10; distance from tip of snout to front of orbit 11.5; diameter of eye 5; distance from tip of snout to end of maxillary 11; length of gill slit 3.1; greatest depth of body 25; distance from tip of snout to front of disk 16; to anus 26; to front of anal fin 35; to front of dorsal 27; diameter of disk 5.5; distance from disk to anus 6; longest pectoral ray of upper lobe 18; of lower lobe 9; shortest ray in notch 7.

Dorsal 57; anal 48; pectoral 30; pyloric cæca 22.

Body deep and compressed, resembling in this respect *C. segalensis* and *Crystallichthys mirabilis*. Head short, deep and compressed,

its depth greater than its width; interorbital narrow. Snout short, rising abruptly, scarcely overpassing the mouth; jaws equal; nostril in a prominent tube; eye small, not prominent. Mouth narrow; maxillary reaching vertical from middle of pupil. Teeth simple, lanceolate, curved backward, in 8 or 10 oblique rows in the half of each jaw. Gill slit reduced to a small opening above pectoral, not extending down to upper pectoral ray.

Origin of dorsal above gill slit; about 15 of the anterior rays enveloped in a gelatinous tissue beneath the skin. Caudal of eight rays; anal joined to basal half of caudal. Pectoral notched, the lower lobe short, consisting of five rays, the longest reaching nearly to

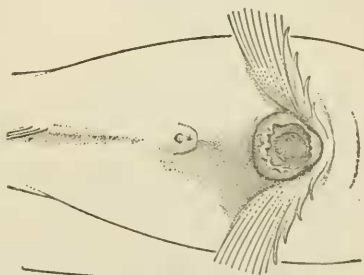


FIG. 11.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CAREPROCTUS ROSEOFUSCUS.

vent. Disk small, deeply cupped and probably functionless, separated from vent by a distance slightly exceeding its own diameter. (Fig. 11.)

Skin translucent, the anterior parts rosy in life; abdomen and peritoneum black; posterior margin of dorsal and anal and the caudal dusky.

Two cotypes from the type-locality, and two other cotypes from station 5018, off Cape Tonin, east coast of Sagalin, 100 fathoms.

19. CAREPROCTUS COLLETTI Gilbert.

Plate 46, fig. 1.

Careproctus colletti GILBERT, Rept. Comm. Fish and Fisheries for 1893 (1896), p. 442.

Known hitherto only from small specimens (the type 85 mm. long) taken south of the Alaska Peninsula, at a depth of 625 fathoms. Through the present collection, its range is extended to the southern Okhotsk and the northern part of the Sea of Japan, and much larger specimens were obtained, the largest reaching a length of 298 mm. The following description is based on the new material.

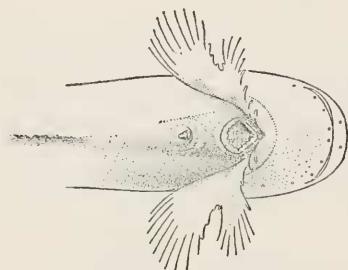


FIG. 12.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CAREPROCTUS COLLETTI.

Measurements in hundredths of length without caudal: Length of head 23; width of head 14.5; interocular width 11; width at angles of mouth 12.3; distance from tip of snout to front of orbit 8.8; diameter of eye 5; distance from tip of snout to end of maxillary 13; length of gill slit 3; depth

of body 28; distance from tip of snout to front of disk 15; to anus 21.5; to front of anal 36; to front of dorsal 28; diameter of disk 4.6; distance from disk to anus 2.3; longest pectoral ray of upper lobe 15; of lower lobe 26; of shortest ray in notch 5.2.

Dorsal 55; anal 49; pectoral 28; caudal 10; pyloric caeca 13.

The species is apparently always smooth, as two adult males and two adult females are alike without any trace of simple or multifid prickles; form compressed, of medium depth, the top of head gently convex transversely, a trifle flattened above front of orbit; cheeks subvertical; snout very deep, bluntly rounded, a little protruding beyond premaxillaries; mouth broadly curved, with short lateral cleft, the tip of maxillary below middle of eye; teeth lanceolate, without cusps, in adults in very numerous oblique series, 20 to 26 in half of each jaw. A distinct short nostril tube, inserted slightly below level of upper rim of orbit. Gill slit short, wholly above pectoral base.

Disk small, distinctly cupped, its center under middle of cheek behind eye, its distance from vent from a half to three fourths its own diameter. (Fig. 12.)

Pectoral rays shortening regularly to the notch, which is not unusually deep, the long exerted lower rays beginning abruptly; longest rays of lower lobe extending well behind the upper part of fin, and beyond the origin of the anal.

Caudal broad, of ten rays, its posterior margin gently concave, evidently approaching the condition in *Prognurus*; caudal joined to anal for two-fifths its length.

Color in life gray, everywhere very finely punctulate with black; head, body, and fins lightly tinged with red, most pronounced on front of head and on pectoral fins. Lower pectoral rays faintly barred. Vertical fins anteriorly with a narrow black margin, which gradually broadens posteriorly until it involves the entire height of the fins. Lips, mouth, and gill cavity dusky, the peritoneum black.

Specimens were taken from the following stations:

	Fathoms.
4982. Off northwest coast of Hokkaido.....	390
5029. Southern Okhotsk Sea, off Cape Patience.....	440

20. CAREPROCTUS SINENSIS, new species.

Plate 46, fig. 2.

Type.—Cat. No. 73339, U.S.N.M.—A male, 68 mm. in total length, from station 4813, off Sado Island, Sea of Japan; depth 200 fathoms.

Measurements in hundredths of length exclusive of caudal fin (63 mm.): Length of head 27; interocular width 12; greatest width of head 15; width at angles of mouth 12; distance from tip of snout to front of orbit 11; diameter of eye 5; distance from front of upper jaw to tip of maxillary 12; length of gill slit 4.5; greatest depth (opposite nape) 27; distance from tip of snout to front of disk 19; to anus 27; to front of anal fin 40; to front of dorsal 30; diameter of disk 7.5; longest pectoral ray of upper lobe 22; of lower lobe 11; shortest ray in notch 7.

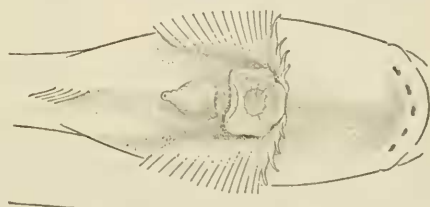


FIG. 13.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CAREPROCTUS SINENSIS.

Dorsal 47; anal 47; pectoral 33.

Body deepest at nape, which is strongly convex and protruding; depth decreasing rapidly at middle of pectoral. Head compressed, deep, sides vertical; occiput swollen, rising abruptly. Snout not split, slightly or not at all projecting beyond premaxillaries; nostril in a short tube, in front of eye; eye small; mouth terminal, maxillary reaching vertical from pupil. Teeth slender, weakly trilobed, in broad bands, the outer teeth smaller in size. Gill slit wholly above the pectoral, its lower end on level of upper pectoral ray.

Five or six anterior dorsal rays shortened, not protruding through the lax skin. Caudal moderate, joined to anal for half its length;

dorsal and anal joining caudal without notch. Pectoral notched, the lower lobe consisting of six short thickened rays with free tips, which reach slightly past the vent. Disk well developed, its anterior edge a short distance behind the eye. Vent immediately behind disk. (Fig. 13.)

Color pale, skin transparent, probably pinkish in life.

Only the type known.

21. CAREPROCTUS PYCNOSOMA, new species.

Plate 46, fig. 3.

Type.—Cat. No. 73340, U.S.N.M. Forty-six mm. long, from station 4803, off Simushir Island, Japan; depth 229 fathoms.

Measurements in hundredths of length without caudal fin (41 mm.): Length of head 28; greatest width of head 18; interocular width 10; width at angles of mouth 12; distance from tip of snout to front of orbit 9.5; diameter of eye 7.5; diameter of pupil 3; distance from tip of snout to end of maxillary 10; length of gill slit 4.5; greatest depth of body 19; distance from tip of snout to front of disk 15.5; to anus 31; to front of anal fin 41; to front of dorsal 31; diameter of disk 8; distance from disk to anus 7; longest pectoral ray of upper lobe 17; of lower lobe 10; of shortest ray in notch 9.

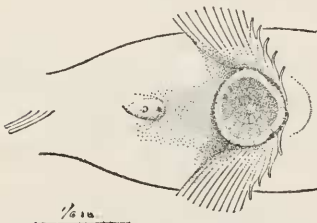


FIG. 14.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CAREPROCTUS PYCNOSOMA.

Dorsal 42; anal 37; pectoral 37.

Body short, rather slender, compressed; head thick and blunt, nearly as wide as deep; sides of head vertical; occiput not swollen. Snout blunt, broad, not high, and not protruding beyond premaxillaries; nostril tube short but well developed, its posterior margin raised into a flap; its insertion high, on level with upper rim of orbit. Mouth broad, maxillary reaching vertical from slightly behind anterior margin of eye. Teeth strongly trilobed, in broad bands. Gill opening short, wholly above pectoral.

Anterior dorsal rays not shortened, their tips free, not hidden beneath the skin. Caudal broad, truncate, of about 10 rays, joined to anal for one-third its length; no dorsal or anal notch. Pectoral very little notched, the lower lobe of 7 rays and very short. Disk moderate, not deeply cupped, the anterior edge under posterior margin of pupil. Vent separated from disk by two-thirds diameter of disk. (Fig. 14.)

Color dusky, lighter about head and snout.

Apparently related to *C. ectenes*, but distinguished by shape of snout and length of body and the number of fin rays.

Only the type taken.

22. CAREPROCTUS CURILANUS, new species.

Plate 47, fig. 1.

Type.—Cat. No. 73341, U.S.N.M. A male, 72 mm. long, from station 4803, off Simushir Island, Japan; depth 229 fathoms.

Measurements in hundredths of length without caudal (66 mm.): Length of head 22.5; greatest width of head 16; interorbital width 4.2; width at upper margin of pupils 10; width at angles of mouth 11.5; distance from tip of snout to front of orbit 8; diameter of eye 8; distance from tip of snout to end of maxillary 8.5; length of gill slit 4; greatest depth of body 16; distance from tip of snout to front of disk 13; to anus 21.5; to front of anal fin 34; to front of dorsal 24; diameter of disk 8; distance disk to anus 2; longest pectoral ray of upper lobe 15; of lower lobe 15; shortest ray in notch 5.

Dorsal 49; anal 43; pectoral 34; caudal 10.

Body as in *C. ectenes*, depressed anteriorly, elongate. Head depressed, its width greater than its depth; occiput flattened; cheeks slightly swollen; snout depressed, projecting slightly beyond the mouth; nostril in a well developed tube, on level of upper line of pupil; eye large, the pupil large and round; mouth small, transverse; maxillary reaching vertical from anterior margin of pupil. Teeth in broad bands, rather slender, with well developed lateral lobes. Gill slit extending down in front of one or two pectoral rays.

Anterior dorsal rays slightly or not at all shortened, the tips projecting freely. Caudal short, truncate; its connection to the anal equal to about two-fifths its length; no dorsal or anal notch. Pectoral notched, the lower lobe composed of nine rays and reaching slightly past vent. Disk moderate, not deeply cupped, with a very small center and a broad flap; vent close behind disk. (Fig. 15.)

Skin transparent; the body pale, dusted with dark brown dots; mouth and gill cavity pale; peritoneum with very fine black dots. In life, deep red, with slight brownish tinge, especially on head; belly purplish or blue.

Related to *C. ectenes*; distinguished by the greater number of rays in the pectoral, the lighter coloration, a larger disk, and the gill opening extending down in front of the pectoral.

A single cotype was taken at the same station as the type.

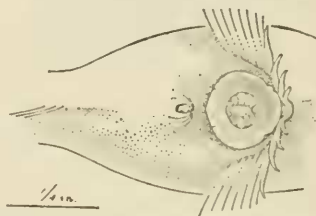


FIG. 15.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CAREPROCTUS CURILANUS.

23. CAREPROCTUS HOMOPTERUS, new species.

Plate 47, fig. 2.

Type.—Cat. No. 73342, U.S.N.M. Forty-eight mm. long, from station 5029, southeast of Cape Patience, Sagalin, depth 440 fathoms.

Measurements in hundredths of length without caudal (43 mm.): Length of head 24; greatest width of head 14; interocular width 10; width at angles of mouth 9; distance from tip of snout to front of eye 8; diameter of eye 6.3; depth of body 18; length of gill slit 3.2; distance from tip of snout to front of disk 14; to anus 26.5; diameter of disk 8; longest pectoral ray of upper lobe 18; of lower lobe 6.

Dorsal 55; anal 49; pectoral 34; caudal 10.

Body slightly deeper and more compressed than in its nearest congener, *C. attenuatus* from Bering Sea, the snout not so deep and less blunt, its upper profile rising more gradually from the mouth. Teeth simple, or some of them with weak lateral lobes. Gill slit

extending down in advance of upper pectoral ray. Nostril placed high, in advance of upper margin of eye, in a broad short tube.

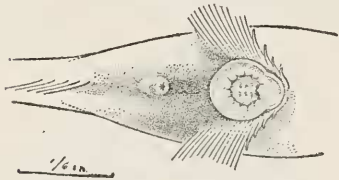


FIG. 16.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CAREPROCTUS HOMOPTERUS.

Anterior dorsal rays increasing regularly in length, the anterior ray short, about half diameter of eye. Pectoral very indistinctly notched, the rays decreasing regularly downwards, a few

of the lower with weakly exerted tips, and two or three of them a trifle lengthened, the longest not reaching posterior border of disk.

Color pale to dusky about the head, nearly uniformly dusky on body; peritoneum pale, the stomach appearing black through the abdominal wall.

In general appearance this species closely resembles *C. attenuatus*, which differs in its blunter deeper snout, larger eye, smaller disk, longer first dorsal ray, and especially in its well developed lower pectoral lobe, in which the rays are lengthened and strongly exerted, extending beyond the vent.

Only the type known.

24. CAREPROCTUS ENTOMELAS, new species.

Plate 47, fig. 3.

Type.—Cat. No. 73343, U.S.N.M., 77 mm. in total length, from station 4983, Shiruunku Bay, west coast Hokkaido, depth 428 fathoms.

Measurements in hundredths of length without caudal (70 mm.): Length of head 25; greatest width of head 15.5; interocular width 12; width at angles of mouth 10.5; distance from tip of snout to

front of orbit 11; diameter of eye 6.5; diameter of pupil 3; distance from tip of snout to end of maxillary 12.5; length of gill slit 3; greatest depth of body 19; distance from tip of snout to front of disk 15; to anus 26.5; to front of anal fin 36; to front of dorsal 27; diameter of disk 7; distance from disk to anus 4; longest pectoral ray of upper lobe 14.5; of lower lobe 15; shortest ray in notch 4.

Dorsal 53; anal 46; pectoral 28; caudal 8; pyloric caeca 19.

Body elongate, moderately compressed. Head deeper than wide, the sides vertical, the occiput flattened and gently convex, not swollen. Pupil large, nearly half diameter of eye. Snout short, deep, bluntly rounded, slightly protruding beyond the premaxillaries; jaws nearly equal; nostril in front of middle of eye or slightly higher, with the rim a little raised. Teeth lanceolate, recurved, in broad bands, about 13 oblique rows in the half of each jaw. Gill slit very narrow, entirely above base of pectoral.

Anterior dorsal rays increasing gradually in length; caudal truncate, slender, its connection with the anale equal to one-third its length; last dorsal and anal rays not shortened; pectoral notched, the tip of upper lobe reaching a point midway between vent and anal origin.

Disk moderate, oval, very deeply cupped, the anterior margin crenulate but not lobed, a notch on each side separating it from posterior margin. Vent near disk, separated from it by slightly more than half length of disk. (Fig. 17.)

Color pale, translucent, everywhere dusted with minute black points, these less numerous and coarser on the abdomen; lips blackish; abdomen silvery, the peritoneum jet black.

Coarse "thumb tack" prickles scattered over top of head and on body.

Closely related to *C. colletti*, differing in the deeper body, the longer more protruding snout, the lighter color, and the presence of prickles.

A badly mutilated specimen from station 4838, west of Tsuruga, Sea of Japan, depth 144 fathoms, seems to belong to this species, but its condition does not admit of positive identification.

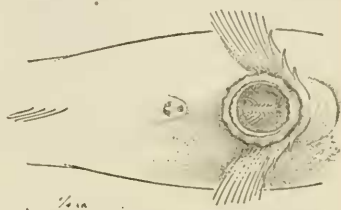


FIG. 17.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CAREPROCTUS ENTOMELAS.

25. CAREPROCTUS ENTARGYREUS, new species.

Plate 47, fig. 4.

Type.—Cat. No. 73344, U.S.N.M., 61 mm. long, from station 4998, Gulf of Tartary, depth 66 fathoms.

Measurements in hundredths of length without caudal fin (57 mm.): Length of head 25; greatest width of head 17; interocular width 13.5; width at angles of orbit 9; diameter of eye 6.5; diameter of pupil 1; distance from tip of snout to end of maxillary 12.5; length

of gill slit 3.5; greatest depth of body 19; distance from tip of snout to front of disk 15.5; to anus 27; to front of anal fin 36; to front of dorsal 28; diameter of disk 9; distance from disk to anus 3; longest pectoral ray of upper lobe 13; of lower lobe 15; shortest ray in notch 6.

Dorsal 54; anal 47; pectoral 31.

Body elongate, with heavy head, vertical cheeks and short bluntly rounded snout which protrudes slightly beyond mouth; nostril in front of eye, slightly above its middle, the rim a little raised; gill slit short, entirely above upper pectoral ray; disk moderate, deeply cupped, its anterior margin prominent, with the appearance of a projecting lobe; vent close behind disk, separated from it by about one-third diameter of disk. (Fig. 18.) Pectorals broad, rather shallowly notched, the lower lobe short, extending little behind the vent.

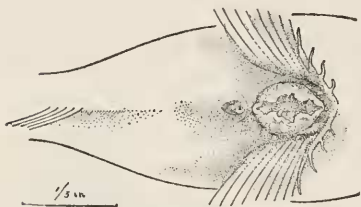


FIG. 18.—RELATIVE SIZE AND POSITION OF VENT AND DISK OF CAREPROCTUS ENTARGYREUS.

Small prickles scattered over head and body.

Color light, without red in life, the lining of mouth and gill cavity not dusky; peritoneum silvery, with scattered black dots, instead of jet black as in *C. entomelas*.

Agreeing in most respects with *C. entomelas*, but with less black pigment, and with the pupil reduced to a minute pore, while in *C. entomelas* it is of the usual size, nearly half the diameter of the eye.

A single cotype, from the Gulf of Tartary (station 5003, 35 fathoms) agrees with the type in all respects.

26. CRYSTALLIAS MATSUSHIMÆ Jordan and Snyder.

Crystallias matsushimæ JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 350, fig. 2 (Matsushima Bay, Japan).

This species, known hitherto from a single specimen from the Bay of Matsushima, is represented in the present collection by eight individuals from the Sea of Japan and the Southern Okhotsk. Owing to the poor condition of the type-specimen, the original description was incomplete and the following details are here supplied:

Measurements in hundredths of length without caudal (197 mm.): Length of head 30; diameter of eye 5.5; length of snout 13; interocular width 13; projection of snout beyond the mouth 8; length of gill slit 5; distance from tip of mandible to front of disk 8; to anus 17; diameter of disk 7.5; depth of body 35; longest pectoral ray of upper lobe 21; of lower lobe 11; length of caudal 13; length of attachment between caudal and anal 9.

Dorsal 57; anal 50; pectoral 33; caudal 13, 6 in upper half, 7 in the lower; pyloric cæca 54.

Form deeper than indicated in the figure of the type,¹ the snout projecting much farther beyond the mouth and the barbels much larger and more conspicuous. The barbels are 16 in number, constant in position, attached to the inferior side of the snout, the upper lip and the chin. On the snout is an anterior row of two, each with a small papilla-like projection at its outer base, and a posterior row of six, following the curve of the mouth, the middle pair closely apposed. The upper lip is produced into a deep flap, the margin of which bears three barbels. The chin bears a median barbel and two on each side, the inner pair accompanied posteriorly by a papilla-like projection. The snout and mandible contain the usual pores, which alternate with the barbels.

The pectoral fin is only shallowly notched, the lower rays becoming more and more exerted, and a few of them slightly elongated to form a lobe. The caudal fin is widely joined to dorsal and anal, the last dorsal rays slightly shortened, forming a notch, the anal joining without notch. Ventral disk of moderate size, its anterior margin immediately under the vertical from back of eye, the vent close behind it.

Color in life, translucent, with a slight reddish tint, the half-bars and spots a deeper reddish brown, darker on the margins of the bars.

Specimens were taken from the following stations:

	Fathoms.
4812. Near Sado Islands, Sea of Japan.....	176
4813. Near Sado Islands, Sea of Japan.....	200
4855. Off Korea, Sea of Japan.....	70
4867. Off Korea, Sea of Japan.....	150
4994. Off northwest end Hokkaido.....	190
5021. Off Cape Patience, Sagalin.....	73
5025. Off Cape Patience, Sagalin.....	52

27. PARALIPARIS ATRAMENTATUS, new species.

Plate 48, fig. 1.

Type.—Cat. No. 73345, U.S.N.M. A male, 76 mm. long, from station 4971, off the east coast of Hondo; depth 649 fathoms.

Measurements in hundredths of length without caudal (69 mm.): Length of head 22; of snout 6; of maxillary 9; diameter of eye 6; interocular width 8.2; distance from tip of snout to anus 18; to front of anal fin 34; to front of dorsal 19.5; greatest depth of body 15.

Dorsal 52; anal 44; caudal 8; pectoral 20.

Body slender, elongate. Head depressed, the crown flat, slightly raised. Snout short and deep, rising abruptly, slightly projecting beyond the mouth; lower jaw included. Nostril in a short narrow tube, in front of eye on level of upper margin of pupil. Mouth horizontal, beneath the snout; maxillary reaching vertical from posterior margin of eye. Teeth stout and blunt, not pointed, arranged in narrow bands, about eight oblique rows laterally in each jaw. Gill opening apparently wholly above pectoral.

First dorsal rays short, increasing gradually in length. Caudal consisting of eight slender rays, its basal third apparently joined to anal. Pectoral consisting of two elongate lobes connected by short widely spaced rays; the upper lobe reaching slightly past origin of anal; lower lobe mutilated in the type, its shape not to be determined. Vent under upper base of pectoral.

Coloration apparently black or dusty, the integument largely lost; snout dusky; abdomen and peritoneum black.

Not closely related to any known species, differing widely from all others in the character of the teeth.

Only the type taken.

28. *PARALIPARIS MELANOBRANCHUS*, new species.

Plate 48, fig. 2.

Type.—Cat. No. 73346, U.S.N.M. A male, 83 mm. long, from station 5029, in the southern part of the Chhotsk Sea; depth 440 fathoms.

Measurements in hundredths of length without caudal (76 mm.): Length of head 22; of snout 6; of maxillary 9.5; diameter of eye 6; length of gill slit 3; interocular width 8; distance from tip of snout to anus 16; to front of anal 30; to front of dorsal 25; greatest depth 21; length of base of pectoral 13; longest pectoral ray of upper lobe 13; of lower lobe 11; shortest ray in notch 7.5.

Dorsal 60; anal 53; pectoral 17; caudal 4.

Body moderately deep and compressed, the upper profile rising in a strong convex curve to occiput, thence declining rapidly in a straight line to nostrils; snout bluntly rounded; interorbital flat and broad; eye large; jaws even; nostril in front of middle of eye, with a slightly raised rim. Mouth broad, angle under pupil; maxillary reaching vertical from posterior margin of eye. Teeth rather stout, in broad bands, the inner teeth not enlarged or canineline, in about 12 oblique rows. Gill slit small, wholly above pectoral.

Anterior dorsal rays short and increasing very gradually in length. Caudal slender, truncate, of four slender rays, joined to anal for about one-third its length. Pectoral notched, upper rays on level of pupil, close set, the intervals between the rays increasing downward, those in the notch very distant, but the membrane extending from tip to tip, not cleft to base of fin; upper lobe reaching a little past front of anal. Vent close behind base of pectorals.

Skin transparent, with a few scattered dots; body dusted with dark brown dots; chin dusky; abdomen, gill cavity, and mouth black.

Only the type taken.

29. *PARALIPARIS ENTOCHLORIS*, new species.

Plate 48, fig. 3.

Type.—Cat. No. 73347, U.S.N.M. A male, 98 mm. in total length, from station 5018 in the southern part of the Okhotsk Sea; depth 100 fathoms.

Measurements in hundredths of length without caudal (87 mm.): Length of head 22.5; of snout 6; of maxillary 10; diameter of eye 6.5; length of gill slit 3; interocular width 8; distance from tip of snout to anus 17.5; to front of anal 30; to front of dorsal 24; greatest depth 20; length of base of pectoral 13; longest pectoral ray of upper lobe 19; of lower lobe 14; shortest ray in notch 7.

Dorsal 63; anal 56; pectoral 20; caudal 6.

Body rather deep, compressed; occiput only slightly gibbous; snout deep, blunt, not projecting; jaws equal; eye large. Mouth horizontal; maxillary reaching vertical from posterior margin of pupil. Teeth slender, pointed, in well-developed bands, the inner teeth enlarged, caninelike, larger in the upper than in the lower jaw. Nostril in front of eye, on level of upper edge of pupil, the tube little more than a raised rim. Gill slit short, wholly above the base of the pectoral.

Anterior dorsal rays increasing very rapidly in length, the first six or seven graduated; dorsal and anal rays very slender. Caudal composed of six slender elongate rays, its union with anal equal to nearly half its length. Pectoral consisting of two lobes, the lower rays of upper lobe more widely spaced; base of upper pectoral ray on a level with upper edge of pupil; tip of upper pectoral lobe reaching fifth anal ray; lower lobe consisting of five elongate half free rays, reaching almost to anal. Vent well behind base of lower pectoral rays, separated from them by about one-half their distance from tip of mandible.

Head and body entirely denuded of skin; body with scattered black dots, these thickest on occiput; gill cavity black; mouth pale; peritoneum heavily spotted with black. In life, nearly translucent, with a faint tinge of red; peritoneum green, visible through the body walls.

Related to *P. melanobranchus*, differing in the number of pectoral and caudal rays, in the length of the lower lobe of the pectoral, the position of the vent, and in the characters of the teeth and the anterior dorsal rays.

A single cotype was taken with the type.

30. RHINOLIPARIS BARBULIFER Gilbert.

Rhinoliparis barbulifer GILBERT, Rep. Comm. Fish and Fisheries for 1893 (1896), p. 445 (Bering Sea).

Taken abundantly in the southern part of the Okhotsk Sea off the coast of Sagalin, off the south coast of Hokkaido, and near Matsushima Bay, east coast of Hondu; but the species was not taken in the Sea of Japan. It has been known hitherto from Bering Sea north of Unalaska Island, and in its distribution seems to accompany the cold current which sweeps down the coast of northern Japan and can be detected somewhat to the southward of Matsushima Bay.

There is no evidence that this or any closely allied species is pelagic. It has been captured only in the bottom trawl, and its range in depth is such as bottom forms usually exhibit. In Bering Sea it was taken at depths of 225-576 fathoms; in the Japanese waters the depth was found to range from 192 to 359 fathoms.

Specimens were taken from the following stations:

	Fathoms.
5019. Off east coast of Sagalin.....	192
5028. Off east coast of Sagalin.....	241
5039. Off southeast coast Hokkaido.....	269-326
5043. Off southeast coast Hokkaido.....	309-330
5044. Off southeast coast Hokkaido.....	309-359
5045. Off southeast coast Hokkaido.....	359
5050. Off Matsushima Bay.....	266

31. *NECTOLIPARIS PELAGICUS* Gilbert and Burke.

Nectoliparis pelagicus GILBERT and BURKE, Bull. Bur. Fish., vol. 30, 1910 (1912), p. 82, fig. 27.

This peculiar pelagic form, which has usually been captured at intermediate depths of 300 fathoms, is not rare throughout Bering Sea and the northern Okhotsk. The present collection contains one specimen from the extreme southern part of the Okhotsk Sea and another from the southern coast of Hokkaido. The species probably entered the dredge at intermediate depths.

Specimens were taken from the following stations:

	Fathoms.
5032. Yezo Suido, southern Okhotsk.....	300-533
5039. Off southeast coast Hokkaido.....	269-326